REMARKS

Rejections under 35 USC §103(a)

Claims 1 and 7 were rejected under 35 USC §103(a) as being obvious over WO 01/18276 A1 (Takada et al.) in view of JP 11-286770 A (JP ('770A)).

Claim 1 has been amended to recite "a molybdenum nitride layer on the nitride-particle-dispersed layer, the molybdenum nitride layer having a thickness of 3 μm or less, the molybdenum nitride layer comprising one or more selected from δ-MoN, γ-Mo_2N, and β-Mo_2N, the molybdenum nitride layer being formed by external nitriding of a worked structure or a recovered structure at the surface of the untreated worked molybdenum-alloy material, wherein the worked molybdenum-alloy material has a higher yield strength than the worked molybdenum-alloy material without the molybdenum nitride layer on the nitride-particle-dispersed layer."

Responding to Applicants' previous response, the Examiner alleged as follows:

> The applicant argues that a person of ordinary skill in the art would not be motivated to nitride the Mo alloy of Takada et al. ('368) as disclosed by JP ('770 A), because Takada et al. ('368) teaches that the Mo is not nitrided because of preferred nitriding. In response, the examiner notes that Takada et al. ('368) does not teach not to nitride the surface of the worked Mo alloy material to improve the corrosion resistance. As stated above, the motivation to nitride the surface of a Mo alloy is to improve the corrosion resistance of the Mo alloy as disclosed by JP ('770 A) (abstract), which would certainly be very appealing to one of ordinary skill in the art.

However, claim 1 also recites "a molybdenum nitride layer on the nitride-particle-dispersed layer, **the molybdenum nitride layer having a thickness of 3 μm or less**, the molybdenum nitride layer comprising one or more selected from δ-MoN, γ-Mo_2N, and β-Mo_2N,

the molybdenum nitride layer being formed by external nitriding of a worked structure or a recovered structure at the surface of the untreated worked molybdenum-alloy material." Regarding these recitations, the Examiner alleges as follows:

> Takada et al. ('368) does not disclose that the worked Mo alloy material comprises a Mo nitride layer at the surface of the worked Mo alloy material as claimed. JP ('770 A) discloses a Mo alloy with a Mo nitride layer having a thickness of 0.5 to 10 microns at the surface (abstract) and the Mo nitride at the surface comprising gamma-Mo_2N, beta-Mo_2N and delta-MoN (paragraph [0003], machine translation). The thickness range of the Mo nitride layer of JP ('770 A) overlaps the claimed thickness range. A prima facie case of obviousness exists. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a Mo nitride layer at the surface of the worked Mo alloy material of Takada et al. ('368) as disclosed by JP ('770 A) in order to improve the corrosion resistance of the worked Mo alloy material of Takada et al. ('368) as disclosed by JP ('770 A) (abstract).

However the prima facie case of obviousness is rebutted based on the description in the present specification. The translation of JP ('770 A) describes on the thickness of the Mo nitride layer as follows:

> In said invention, if nitriding temperature exceeds less than 700°C or 1150°C, an outstanding Mo_2N layer of the target corrosion resistance will not be made. When Mo_2N layer thickness is less than 0.5 micrometer, or also when exceeding 10 micrometers, it is difficult to acquire corrosion resistance made into the purpose of this invention.

(JP ('770 A), paragraph [0009]). Thus, JP ('770 A) simply indicates that Mo_2N layer thickness between 0.5 micrometer and 10 micrometers is preferable for the purpose of corrosion resistance. Nothing in JP (770 A) indicates that the Mo_2N layer improves the strength of the molybdenum-alloy material.

(Table 1)

	Pure Mo	Material subjected to internal nitriding up to third step	(Internal nitriding up to third step) + (external nitriding) (2.8 μm)
Yield strength	550 MPa	1190 MPa	1280 MPa
Maximum strength	750 MPa	1020 MPa	1870 MPa

In contrast, the present specification, Table 1 at page 11, shows the relationship between the temperature of heating treatment and the thickness of the surface layer of a Mo-Ti-alloy. The thickness of molybdenum nitride increases with the heated temperature. It would be preferable to increase the layer thickness in view of corrosion resistance. However, the present inventors found that toughness was reduced with the increase in layer thickness. Also, the present inventors found that thickness of molybdenum nitride layer should be 3 μm or less.

Thus, Takada et al. and JP ('770A) does not teach or suggest, among other things, "a molybdenum nitride layer on the nitride-particle-dispersed layer, the molybdenum nitride layer having a thickness of 3 μm or less, the molybdenum nitride layer comprising one or more selected from δ-MoN, γ-Mo_2N, and β-Mo_2N, the molybdenum nitride layer being formed by external nitriding of a worked structure or a recovered structure at the surface of the untreated worked molybdenum-alloy material, wherein the worked molybdenum-alloy material has a higher yield strength than the worked molybdenum-alloy material without the molybdenum nitride layer on the nitride-particle-dispersed layer."

For at least these reasons, claim 1 patentably distinguishes over Takada et al. and JP ('770A).

Similarly, claim 5, as amended, recites "externally nitriding the worked alloy material through an external nitriding treatment at 900 °C or lower so as to **form a molybdenum nitride layer of 3 μm or less**, wherein the worked molybdenum-alloy material has a higher yield strength than the worked molybdenum-alloy material without the molybdenum nitride layer on the nitride-particle-dispersed layer" Thus, claim 5 also patentably distinguishes over Takada et al. and JP ('770A). Claim 6, depending from claim 5, also patentably distinguishes over Takada et al. and JP ('770A).

Claim 7, as amended, also recites "**a molybdenum nitride layer with a thickness of 3 μm or less**, the molybdenum nitride layer comprising one or more selected from δ-MoN, γ-Mo_2N, and β-Mo_2N, the molybdenum nitride layer being formed by external nitriding of a worked structure or a recovered structure at the surface of the untreated worked molybdenum-alloy material, wherein the worked molybdenum-alloy material has a higher yield strength than the worked molybdenum-alloy material without the molybdenum nitride layer on the nitride-particle-dispersed layer." Thus, claim 7 also patentably distinguishes over Takada et al. and JP ('770A).

In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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